

**EPA Superfund
Record of Decision:**

**ABERDEEN PESTICIDE DUMPS
EPA ID: NCD980843346
OU 02
ABERDEEN, NC
06/30/1989**

FAIRWAY SIX, FARM CHEMICALS, MCIVER, ROUTE 211 AND TWIN SITES. THE FAIRWAY SIX DISPOSAL SITE (OPERABLE UNIT TWO) WAS CREATED AS A DISCRETE RESPONSE ACTION TO ADDRESS PESTICIDE CONTAMINATED SOIL AND DEBRIS REMOVED AND STOCKPILED ONSITE. THE AREA OF THE EXCAVATED TRENCHES ON THE SIXTH FAIRWAY ARE CURRENTLY BEING INVESTIGATED THROUGH THE RI/FS PROCESS FOR OPERABLE UNIT ONE. A FINAL REMEDY CANNOT BE SELECTED FOR OPERABLE UNIT ONE UNTIL AFTER COMPLETION OF THE RI AND FS.

OPERABLE UNIT TWO WILL PERMANENTLY ELIMINATE ANY THREAT ASSOCIATED WITH STOCKPILED MATERIALS AT THE FAIRWAY SIX DISPOSAL SITE WHILE COMPLETE SITE CHARACTERIZATION INFORMATION IS BEING GATHERED AND ANALYZED. THIS REMEDIAL ACTION WILL USE THERMAL TREATMENT TO DETOXYFY CONTAMINATED SOIL AND DEBRIS CURRENTLY STORED ONSITE, ANALYZE AND CONFIRM THAT THE RESIDUAL ASH IS NON-HAZARDOUS AND DISPOSE OF THE RESIDUAL ASH ONSITE. EXACT LOCATION OF THE ONSITE DISPOSAL AREA WILL BE ADDRESSED IN THE REMEDIAL DESIGN PHASE. IMPLEMENTATION OF THIS PHASED APPROACH WILL MINIMIZE THE RISK OF HUMAN OR ENVIRONMENTAL EXPOSURE THROUGH USE OF PROVEN TECHNOLOGIES IN A MANNER CONSISTENT WITH A PERMANENT REMEDY.

#SSCR

5.0 SUMMARY OF SITE CHARACTERISTICS AND RISKS

5.1 SITE CHARACTERISTICS

THE PESTICIDE CONTAMINATED SOIL AND DEBRIS REMOVED FROM: TRENCHES 3 THROUGH 6 IS CURRENTLY STOCKPILED ONSITE IN CHEMICALLY AFFIXED TOP AND BOTTOM 30-MIL PVC LINERS. PRIOR TO EXCAVATION AND STORAGE, THE CURRENTLY STOCKPILED MATERIALS REPRESENTED THE SOURCE OF CONTAMINATION THAT WILL BE ADDRESSED, BY THIS OPERABLE UNIT. THE PILE MEASURES 215, LONG X 110 WIDE X 28' HIGH AND CONTAINS APPROXIMATELY 22,000 CUBIC YARDS (55 MILLION POUNDS) OF MATERIAL. THE STOCKPILE IS ENCLOSED BY A 6 FOOT HIGH CHAIN-LINK FENCE.

THE EPA EMERGENCY RESPONSE ACTION IDENTIFIED CHLORINATED ORGANO-PESTICIDES AS THE PREDOMINANT CONTAMINANTS OF CONCERN AT THE SITE. TABLE 1 ILLUSTRATES CONCENTRATIONS OF CONTAMINANTS FROM SAMPLES COLLECTED AND ANALYZED BY AN ONSITE MOBILE LABORATORY PRIOR TO AND DURING THE AUGUST 1988 REMOVAL ACTION. THREE SELECTED AREAS (A3-0, G1-0, AND G3-2) OF HIGHEST CONCENTRATIONS AMONG ALL "HOT SPOTS" ARE NOTED IN TABLE 1. ANALYTICAL RESULTS OF THESE AREAS ARE REPRESENTATIVE OF THE CHEMICAL NATURE OF THE STOCKPILE. MATERIALS FROM THESE AREAS WERE TRANSPORTED AND INCORPORATED INTO THE STOCKPILE AT THE FAIRWAY SIX DISPOSAL SITE. IN ADDITION TABLE 2 REPRESENTS SAMPLES COLLECTED IN JUNE 1989 FROM THE STOCKPILE TO BETTER CHARACTERIZE THE WASTE MATERIALS IN THE PILE. LISTED IN TABLE 2(B) ARE THE HIGHEST CONCENTRATIONS OF PESTICIDES DETECTED IN THE STOCKPILE. LISTED IN TABLE 2(B) ARE RESULTS OF PESTICIDES IDENTIFIED IN THE SOIL EXTRACT USING THE EP (EXTRACTION PROCEDURE) TOXICITY TEST METHODS. THE WASTE MATERIALS IN THE STOCKPILE ARE CONTAMINATED WITH ALPHA-, BETA-, GAMMA-, AND DELTA-BHC, HEPTACHLOR, DDE, DDT, TOXAPHENE, ALDRIN, DIELDRIN, ENDOSULFAN, DDD AND ALPHA-CHLORDANE.

ANALYSIS OF THE EXCAVATED TRENCHES IDENTIFIED METHYLENE CHLORIDE, ACETONE, AND TOLUENE AT MAXIMUM CONCENTRATIONS OF 480, 1,400, AND 72 UG/KG, RESPECTIVELY. THESE WERE THE ONLY VOLATILE ORGANIC COMPOUNDS (VOCs) DETECTED ABOVE THE LABORATORY DETECTION LIMITS. THESE COMPOUNDS ARE COMMONLY FOUND AS LABORATORY ANALYSIS ARTIFACTS; AND WERE THEREFORE, NOT CONSIDERED IN THE FEASIBILITY STUDY. SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs) WERE DETECTED IN SOME SAMPLES, BUT AT GENERALLY LOW LEVELS. CYANIDE AND PCB'S WERE BELOW DETECTION LIMITS IN ALL SAMPLES.

THE STOCKPILE IS THE SOURCE OF CONTAMINATION OF CONCERN FOR OPERABLE UNIT TWO. THE VARIOUS NON-CONTIGUOUS SITES (OPERABLE UNIT ONE), INCLUDING THE FAIRWAY SIX AREA, ARE BEING ADDRESSED BY THE ON-GOING RI/FS.

TABLE 3 FROM THE BASELINE RISK ASSESSMENT PRESENTS PROPERTIES, ENVIRONMENTAL MOBILITY AND FATE OF SITE CONTAMINANTS. PESTICIDES ARE RELATIVELY IMMOBILE IN THE ENVIRONMENT. AMONG THE PESTICIDES DETECTED, GAMMA-BHC OR LINDANE IS THE MOST MOBILE SPECIES. MOBILE PESTICIDES WILL USUALLY PENETRATE INTO GROUNDWATER OR SURFACE WATER. LESS MOBILE PESTICIDE SPECIES TEND TO BE BOUND TO SOIL PARTICLES, AND BECOME MOBILE ONLY IN ASSOCIATION WITH SOIL PARTICLES VIA EROSION AND RE-DEPOSITION.

NUMEROUS POTENTIAL PATHWAYS OF THE PESTICIDE CONTAMINANTS FROM THE STOCKPILE WERE IDENTIFIED.

HOWEVER, IF THE ENCAPSULATING LINER OF THE OPERABLE UNIT BECOMES DAMAGED, THE MAJOR CONTAMINANT TRANSPORT PATHS POTENTIALLY IMPACTING HUMAN AND ENVIRONMENTAL RECEPTORS ARE;

- WIND-ACTION CAUSING RESUSPENSION OF PESTICIDE CONTAMINATED PARTICLES;
- LEACHING OF CONTAMINANTS INTO GROUNDWATER/SURFACE WATER;
- EROSION OF WASTE AND CONTAMINATED SOILS INTO SURFACE WATERS; AND
- UPTAKE OF SURFACE WATER AND/OR SEDIMENT CONTAMINANTS BY ORGANIC SPECIES, WHICH COULD POTENTIALLY LEAD TO SECONDARY HUMAN INGESTION.

CONTAMINANTS MAY BE TRANSPORTED VIA THESE PATHWAYS TO THE NEARBY GOLF COURSE, TO ABERDEEN CREEK, AND TO PAGES LAKE. THE ENCAPSULATING PVC LINER IS CURRENTLY INTACT; THEREFORE, THE ABOVE CONTAMINANT MIGRATION MECHANISMS ARE NOT OCCURRING, BUT THEY POTENTIALLY COULD OCCUR IF THE LINER BECOMES DAMAGED.

BASED ON THE ASSUMPTION THAT THE PVC LINER WILL EVENTUALLY FAIL, THE POTENTIAL ADVERSE IMPACTS OF THE STOCKPILE ON HUMAN AND ENVIRONMENTAL RECEPTORS ARE;

- (1) USERS OF GROUNDWATER AND SURFACE WATER FOR DRINKING, SHOWERING/BATHING, FOOD PREPARATION, CLOTHES WASHING, AND LAWN OR GARDEN WATERING PURPOSES
- (2) RECREATIONAL USERS OF SURFACE WATERS FOR SWIMMING (DERMAL EXPOSURE) AND BOATING (ACCIDENTAL DERMAL EXPOSURE).
- (3) HUMAN CONSUMPTION OF VEGETATION, SMALL ANIMALS, AND FISH POTENTIALLY CONTAMINATED BY UPTAKE OR INGESTION OF BIOACCUMULATIVE CONTAMINANTS.
- (4) THIRD-PARTY INTRUDERS WHO MAY COME INTO DIRECT DERMAL CONTACT WITH CONTAMINANTS ON SITE.
- (5) AQUATIC BIOTA AND TERRESTRIAL FAUNA AND FLORA THAT MAY BE STRESSED OR INJURED.

5.2 SITE RISKS

THE CONTAMINANTS OF CRITICAL CONCERN FOR THE STOCKPILE OPERABLE UNIT TWO ARE;

- ALDRIN
- ALPHA-, BETA-, DELTA-, AND GAMMA-BHC
- CHLORDANE
- DDE, DDD, AND DDT
- DIELDRIN
- ENDOSULFAN
- ENDRIN
- HEPTACHLOR
- TOXAPHENE

TABLE 4 IS A COMPARATIVE TABLE WHICH LISTS ENVIRONMENTAL EXPOSURE CRITERIA FOR THESE CRITICAL CONTAMINANTS. THE EXPOSURE ASSESSMENT IDENTIFIED FOUR MODES OF EXPOSURE TO THE ORGANO-CHLORINE PESTICIDES IN THE WASTE PILE AS (1) DIRECT CONTACT ON THE SITE, (2) AIR RELEASES FROM THE WASTE PILE, (3) SURFACE WATER CONTAMINATION FROM EROSION OF THE PILE MATERIALS, AND (4) GROUNDWATER CONTAMINATION. EXPOSURE TO THE ORGANO-CHLORINE PESTICIDES ARE DEPENDENT ON THE CONDITION OF THE PVC LINER ENCAPSULATING THE WASTE MATERIAL. POTENTIAL FOR DIRECT CONTACT ON SITE IS UNLIKELY SINCE THE WASTE MATERIAL IS CURRENTLY ENCAPSULATED AND ENCLOSED WITHIN A 6 FOOT HIGH CHAIN-LINK FENCE. AIR RELEASES AND SKIN CONTACT COULD OCCUR AS A RESULT OF FUGITIVE DUST EMISSIONS CAUSED BY WIND EROSION OF THE WASTES AND CONTAMINATED SOILS IN THE STOCKPILE. THE MOST SIGNIFICANT ROUTES OF EXPOSURE FROM THE SITE ARE THROUGH SURFACE WATER AND GROUND WATER CONTAMINATION IF THE PVC LINER IS DAMAGED. THE TOPOGRAPHY SLOPES DOWNWARD TO THE NORTH TO AN UNNAMED CREEK. THE CREEK DISCHARGES VIA A WATER IMPOUNDMENT ABOUT 2,000 FEET NORTHEAST OF THE SITE. THE GROUNDWATER AT THE FAIRWAY SIX DISPOSAL SITE IS HYDROGEOLOGICALLY CONNECTED TO THE SANDHILLS AQUIFER, WHICH IS USED FOR AGRICULTURAL, RESIDENTIAL, AND PUBLIC WATER SUPPLIES IN THE STUDY REGION. APPROXIMATELY 5,000 LOCAL RESIDENTS USE THE ABERDEEN MUNICIPAL WATER SYSTEM WHICH IS

SUPPLIED BY TWELVE MUNICIPAL WELLS WITHIN THE SANDHILLS AQUIFER. WELL NO. 1 HAS BEEN OUT OF SERVICE SINCE 1986 AS A RESULT OF LINDANE CONTAMINATION EXCEEDING THE MCL OF 4 PPB. AN UNKNOWN NUMBER OF RURAL RESIDENTS ALSO OBTAIN THEIR DRINKING WATER FROM WELLS DRILLED INTO THIS AQUIFER. GROUNDWATER CONTAMINATION WITH LINDANE HAS BEEN DOCUMENTED IN BOTH MUNICIPAL AND RESIDENTIAL WELLS WITHIN THE ABERDEEN AREA. THE CONTAMINANTS DETECTED AT THE FAIRWAY SIX DISPOSAL SITE ARE PREDOMINANTLY ORGANO-CHLORINE PESTICIDES. THESE COMPOUNDS CAN INTERFERE WITH AXONIC TRANSMISSION OF NERVE IMPULSES. THE DISRUPTION OF NERVOUS SYSTEM FUNCTION, ESPECIALLY THAT OF THE BRAIN, RESULTS IN BEHAVIORAL CHANGES, SENSORY AND EQUILIBRIUM DISTURBANCES, INVOLUNTARY MUSCLE ACTIVITY, AND DEPRESSION OF VITAL CENTERS, PARTICULARLY RESPIRATORY CENTERS. WHEN ORGANO-CHLORINE PESTICIDES ARE INGESTED, NAUSEA AND VOMITING COMMONLY OCCUR. WHEN DERMALLY ABSORBED, APPREHENSION, CONFUSION, TWITCHING, TREMORS, AND CONVULSIONS MAY BE THE FIRST SYMPTOMS. RESPIRATORY DEPRESSION IS CAUSED BY THESE PESTICIDES AND BY THE SOLVENTS IN WHICH THEY ARE USUALLY DISSOLVED. SELECT ORGANO-CHLORINE PESTICIDES ALSO CAUSE MYOCARDIAL IRRITABILITY. ALTHOUGH CONVULSIVE ACTIVITY IN ORGANO-CHLORINE PESTICIDE POISONING MAY BE SEVERE, THERE IS A GOOD LIKELIHOOD OF COMPLETE RECOVERY IF CONVULSIONS ARE CONTROLLED AND VITAL FUNCTIONS SUSTAINED.

THE ACUTE TOXICITY OF THE ORGANO-CHLORINE PESTICIDES (OCPS) FOUND IN THE STOCKPILE RANGE FROM HIGHLY TOXIC FOR ENDRIN TO MODERATELY TOXIC FOR MOST OF THE OTHER PESTICIDES FOUND.

IN ADDITION TO THE ACUTE TOXIC EFFECTS OF THE OCPS, NUMEROUS AFFECTS RESULTING FROM CHRONIC EXPOSURE HAVE BEEN DOCUMENTED DDT, CHLORDANE, HEPTACHLOR, AND TOXAPHENE HAVE BEEN SHOWN TO INCREASE THE INCIDENCE OF LIVER TUMORS IN LABORATORY ANIMALS. IMPAIRMENT OF REPRODUCTIVE FUNCTION IN LABORATORY ANIMALS BY OCPS HAS ALSO BEEN FREQUENTLY REPORTED. IN A FEW CASES, CHLORDANE HAS APPARENTLY INDUCED MEGALOBlastic ANEMIA AFTER PROTRACTED LOW-LEVEL EXPOSURES, WHICH RESOLVED FOLLOWING TERMINATION OF THE EXPOSURE. LINDANE IS A SUSPECTED HEPATOTOXIC AGENT IN PREDISPOSED INDIVIDUALS. AS CHLORINATED HYDROCARBONS THE OCPS STIMULATE THE PRODUCTION OF DRUG-METABOLIZING ENZYMES IN THE LIVER. INDUCTION OF THESE ENZYMES IS ASSOCIATED WITH INCREASED LIVER WEIGHT AND CHANGES IN LIVER CELLS.

ORGANOCHLORIDE PESTICIDES ARE HIGHLY BIOACCUMULATIVE IN FISH AND ARE AMONG THE MOST TOXIC OF PESTICIDES TO AQUATIC LIFE. OCPS ACCUMULATE IN FISH TISSUE. MANY OCPS, INCLUDING THOSE LISTED ON TABLE 4, POSE CHRONIC TOXICITY TO AQUATIC ANIMALS AT AMBIENT WATER CONCENTRATIONS BELOW 1 UG/L. OCPS BIOCONCENTRATED IN AQUATIC LIFE MAY PRODUCE ADVERSE EFFECTS IN THE WILDLIFE CONSUMING THEM AS WELL.

SEVERAL OF THE PESTICIDES IDENTIFIED TO BE PRESENT IN THE TOCKPILE ARE CARCINOGENIC IN ANIMALS AND SOME OF THESE ARE POTENTIALLY CARCINOGENIC IN MAN;

- BHCS (POSITIVE CARCINOGEN IN ANIMALS, SUSPECTED IN MAN);
- DDE (POSITIVE CARCINOGEN IN ANIMALS, POTENTIAL IN MAN);
- DDT (POSITIVE CARCINOGEN IN ANIMALS, POTENTIAL IN MAN);
- HEPTACHLOR (POSITIVE CARCINOGEN IN ANIMALS, SUSPECTED IN MAN); AND
- LINDANE (POSITIVE CARCINOGEN IN ANIMALS, SUSPECTED IN MAN).

THERE IS POTENTIAL FOR CANCER RISKS POSED BY THE OCP'S FOUND IN THE STOCKPILE (IF THE STOCKPILE REMAINS ON SITE). THE RISKS ARE POTENTIALLY INCREASED BECAUSE OF THE SYNERGISTIC EFFECT OF COMBINED PESTICIDES AND THE HIGH CONCENTRATIONS OBSERVED IN THE WASTES AND CONTAMINATED SOILS. IN ADDITION TO BEING TOXIC AND CARCINOGENIC, SOME OF THE PESTICIDES CONTAINED IN THE STOCKPILE ARE ALSO EXTREMELY PERSISTENT IN THE ENVIRONMENT.

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6.0 ALTERNATIVES EVALUATION

THE PURPOSE OF REMEDIAL ACTION AT THE FAIRWAY SIX DISPOSAL SITE OPERABLE UNIT TWO IS TO MITIGATE AND MINIMIZE POTENTIAL RISKS TO PUBLIC HEALTH, WELFARE, AND THE ENVIRONMENT POSED BY CONTAMINATED SITE SOILS. THE RISKS HAVE BEEN TEMPORARILY CONTROLLED BY REMOVING THE CONTAMINATED SOIL FROM THE SUBSURFACE AND ENCAPSULATING IT ON SITE IN A TOP AND BOTTOM LINER AND RESTRICTING SITE ACCESS BY ENCLOSING THE STOCKPILE WITHIN A 6 FOOT HIGH CHAIN-LINK FENCE.

AN INITIAL SCREENING OF APPLICABLE TECHNOLOGIES WAS PERFORMED TO IDENTIFY THOSE WHICH BEST MEET THE CRITERIA OF SECTION 300.68 OF THE NATIONAL CONTINGENCY PLAN (NCP). AT THE INITIAL STAGE OF THE FS, ALTERNATIVES WERE SCREENED BASED ON SITE-SPECIFIC PROBLEMS, ASSOCIATED REMEDIAL COSTS, AND ACCEPTABLE ENGINEERING PRACTICES. THE TECHNOLOGY ALTERNATIVE DEVELOPMENT AND SCREENING PROCESS IS GENERALLY PERFORMED ON AN INFORMAL-BASIS, USUALLY DESCRIBED AS "BEST ENGINEERING JUDGEMENT ". FOLLOWING THE INITIAL SCREENING OF TECHNOLOGIES, POTENTIAL REMEDIAL ACTION ALTERNATIVES WERE IDENTIFIED AND ANALYZED. TABLE 5 IDENTIFIES TECHNOLOGY ALTERNATIVES WHICH WERE EVALUATED FOR APPLICATION TO THE STOCKPILE AT THE SITE. UPON COMPLETION OF THIS EVALUATION, THE TECHNOLOGY ALTERNATIVES THAT WERE DETERMINED TO BE THE MOST FEASIBLE WERE USED TO DEVELOP VARIOUS REMEDIAL ACTION ALTERNATIVES. A DETAILED DEVELOPMENT AND EVALUATION OF THE REMAINING ALTERNATIVES WAS BASED ON COST-EFFECTIVENESS, LONG-TERM EFFECTIVENESS AND PERMANENT REMEDY, REDUCTION OF VOLUME, TOXICITY AND MOBILITY OF HAZARDOUS CONTAMINANTS OF CONCERN, IMPLEMENTABILITY, STATE ACCEPTANCE, RESPONSIVENESS TO COMMUNITY CONCERNS, COMPLIANCE WITH ARAR'S TO THE EXTENT FEASIBLE AND EFFECTIVENESS OVER THE SHORT-TERM AS WELL AS THE LONG-TERM.

THE MATERIALS IN THE STOCKPILE ONSITE ARE CONTAMINATED SOIL AND DEBRIS. THEY ARE SUBJECT TO THE LAND DISPOSAL RESTRICTIONS REGULATIONS BECAUSE;

- (1) PLACEMENT HAS OCCURRED; AND
- (2) THEY HAVE BEEN SHOWN TO EXHIBIT RCRA CHARACTERISTICS OF A HAZARDOUS WASTE UNDER 40 CFR, SUBPART C, SPECIFICALLY THE EP TOXICITY CHARACTERISTIC {TABLE 2(B)}, FOUND IN SS 261.24 (B).

ALTHOUGH THE MATERIALS IN THE STOCKPILE ARE RCRA WASTE BY CHARACTERISTIC, THE SOURCE OF THE MATERIALS IS UNCERTAIN AND CANNOT BE CLASSIFIED AS A DISCARDED COMMERCIAL CHEMICAL AND IS THEREFORE NOT A RCRA LISTED "P" OR "U" WASTE UNDER 40 CFR \$ 261.33.

ANALYSIS OF SAMPLES FROM THE EXCAVATED TRENCH MATERIAL IDENTIFIED TOTAL CONCENTRATIONS OF HALOGENATED ORGANIC COMPOUNDS (HOCs) IN EXCESS OF 1000 MG/KG. THUS, SINCE THIS MATERIAL HAS EXHIBITED THE EP TOXICITY CHARACTERISTIC, IS A CALIFORNIA LIST WASTE. THE TREATMENT STANDARD IDENTIFIED IN 40 CFR \$ 268.42 (A)(2) FOR A CALIFORNIA LIST HOC WASTE IN TOTAL CONCENTRATIONS GREATER THAN 1000 MG/KG IS THERMAL TREATMENT.

THE ALTERNATIVES CAN BE GROUPED INTO TWO BASIC CATEGORIES: LAND DISPOSAL WITHOUT TREATMENT AND LAND DISPOSAL WITH PRIOR THERMAL TREATMENT. THE LATTER WOULD INVOLVE THERMAL TREATMENT OF 22,000 CUBIC YARDS OF CONTAMINATED SOIL AND DEBRIS. THE FOLLOWING EIGHT REMEDIAL ACTION ALTERNATIVES WERE CONSIDERED;

1. NO ACTION
2. NO ACTION WITH PERIODIC ENVIRONMENTAL MONITORING.
 - INSPECT THE PVC LINER SYSTEM FOR DAMAGE
 - REPAIR DAMAGE IF NECESSARY
3. ONSITE RCRA LAND DISPOSAL
 - CONSTRUCT AND OPERATE AN ONSITE LANDFILL IN COMPLIANCE WITH RCRA REQUIREMENTS AND STANDARDS
 - UTILIZE FRONT-END LOADERS TO TRANSPORT WASTE TO LANDFILL
 - MONITORING AND SYSTEM REPAIR ONCE EVERY FIVE YEARS FOR 30 YEARS
4. OFFSITE RCRA LAND DISPOSAL
 - LOAD CONTAMINATED SOIL AND DEBRIS INTO DUMP TRUNKS USING FRONT-END LOADERS
 - COVER WASTE WITH TARPS TO PREVENT SPILLAGE AND TO MINIMIZE ENTRAINMENT
 - MANIFEST AND HAUL TO AN OFFSITE LANDFILL MEETING RCRA REQUIREMENTS
5. ONSITE THERMAL TREATMENT OF WASTES AND OFFSITE RCRA LAND DISPOSAL OF RESIDUAL ASH
 - TRANSFER WASTE MATERIALS FROM STOCKPILE TO TEMPORARY WASTE FEED HOMOGENIZING AREA AND HOMOGENIZE THEM

- THERMAL TREATMENT OF HOMOGENIZED WASTES IN AN ONSITE MOBILE THERMAL TREATMENT FACILITY IN COMPLIANCE WITH RCRA STANDARDS
- ONSITE TREATMENT OF PROCESS WASTEWATER OR SCRUBBER BLOWDOWN SLUDGE BY REINJECTION INTO THE THERMAL TREATMENT FACILITY
- OFFSITE DISPOSAL OF RESIDUAL ASH
- AIR MONITORING OF EMISSIONS

6. ONSITE THERMAL TREATMENT OF WASTE AND ONSITE RCRA LAND DISPOSAL OF RESIDUAL ASH

- TRANSFER WASTE MATERIALS FROM STOCKPILE TO TEMPORARY WASTE FEED HOMOGENIZING AREA AND HOMOGENIZE THEM
- THERMAL TREATMENT OF HOMOGENIZED WASTES IN AN ONSITE MOBILE THERMAL TREATMENT FACILITY IN COMPLIANCE WITH RCRA STANDARDS
- ONSITE TREATMENT OF PROCESS WASTEWATER OR SCRUBBER BLOWDOWN SLUDGE BY REINJECTION INTO THE THERMAL TREATMENT FACILITY
- CONSTRUCT AND OPERATE AN ONSITE LANDFILL IN COMPLIANCE WITH RCRA REQUIREMENTS AND STANDARDS
- DISPOSE RESIDUAL ASH IN THE ONSITE RCRA LANDFILL
- AIR MONITORING OF EMISSIONS

7. OFFSITE THERMAL TREATMENT OF WASTE AND OFFSITE RCRA LAND DISPOSAL OF RESIDUAL ASH

- LOAD WASTE MATERIALS INTO DUMP TRUCKS USING FRONT END LOADERS
- COVER WASTE WITH TARPS TO PREVENT SPILLAGE AND TO MINIMIZE AIR ENTRAINMENT
- MANIFEST AND HAUL TO AN OFFSITE RCRA-APPROVED THERMAL TREATMENT FACILITY

8. ONSITE THERMAL TREATMENT OF WASTE AND ONSITE LAND DISPOSAL OF RESIDUAL ASH

- TRANSFER WASTE MATERIALS FROM STOCKPILE TO TEMPORARY WASTE FEED HOMOGENIZING AREA AND HOMOGENIZE THEM
- THERMAL TREATMENT OF HOMOGENIZED WASTES IN AN ONSITE MOBILE THERMAL TREATMENT FACILITY IN COMPLIANCE WITH RCRA STANDARDS
- ONSITE TREATMENT OF PROCESS WASTEWATER OR SCRUBBER BLOWDOWN BY REINJECTION INTO THE THERMAL TREATMENT FACILITY
- CONFIRMATORY ANALYSIS OF THE RESIDUAL ASH TO DEMONSTRATE THE ASH IS NON-HAZARDOUS PER RCRA
- AIR MONITOR EMISSIONS
- DISPOSE RESIDUAL ASH ONSITE

6.1 DESCRIPTION OF ALTERNATIVES

ALTERNATIVE 1

THE SUPERFUND PROGRAM REQUIRES THAT THE "NO-ACTION" ALTERNATIVE BE CONSIDERED AT EVERY SITE. UNDER THE "NO-ACTION" ALTERNATIVE, EPA WOULD TAKE NO FURTHER ACTION AT THE SITE TO CONTROL THE SOURCE OF CONTAMINATION. THIS ALTERNATIVE SERVES AS A BASELINE TO WHICH OTHER ALTERNATIVES CAN BE COMPARED. THE CONTAMINATED WASTE WOULD REMAIN ENCAPSULATED IN THE 30-MIL PVC LINER SYSTEM. THE MANUFACTURER'S GUARANTEE ON THIS LINER IS APPROXIMATELY ONE YEAR. THE PHYSICAL INTEGRITY OF THE LINER WILL BE CHALLENGED AND IT WILL, UNDOUBTEDLY, EVENTUALLY DETERIORATE AND FAIL. DAMAGE TO THE LINER WOULD RESULT IN UNCONTROLLED RELEASES OF PESTICIDE CONTAINING WASTE MATERIALS FROM THE STOCKPILE TO THE MULTI-MEDIA ENVIRONMENT AT THE SITE. AREA SURFICIAL SOILS, SEDIMENTS, SURFACE WATER, GROUNDWATER, AND BIOTA COULD BE CONTAMINATED OR DAMAGED.

THIS ALTERNATIVE DOES NOT ATTAIN ARARS. ALSO, THIS ALTERNATIVE INADEQUATELY COMPLIES WITH THE CERCLA/SARA AND NCP OBJECTIVES OF REDUCING WASTE VOLUME, TOXICITY, AND MOBILITY. POTENTIAL LONG-TERM THREAT TO PUBLIC HEALTH IS NOT ADDRESSED UNDER THIS ALTERNATIVE. INSTITUTIONAL CONTROL OF LAND USE WOULD BE REQUIRED INDEFINITELY. THERE ARE NO COSTS ASSOCIATED WITH THIS NO ACTION ALTERNATIVE.

ALTERNATIVE 2

UNDER THE ALTERNATIVE OF NO ACTION WITH PERIODIC ENVIRONMENTAL MONITORING, NO ADDITIONAL REMEDIAL ACTIVITIES WOULD BE PERFORMED. THE PVC LINER SYSTEM WOULD BE PERIODICALLY INSPECTED

FOR DAMAGE TO THE TOP LINER WHICH WOULD BE REPAIRED AS IT IS DISCOVERED. NO OTHER ENVIRONMENTAL MONITORING WOULD BE PERFORMED.

ALTHOUGH THIS ALTERNATIVE MEETS CERCLA/SARA GOALS OF PREVENTING OR MINIMIZING MIGRATION OF HAZARDOUS SUBSTANCES ON A SHORT-TERM BASIS, THE POTENTIAL LONG-TERM THREAT TO THE ENVIRONMENT OR PUBLIC HEALTH FOLLOWING IRREPARABLE DETERIORATION OF THE BOTTOM ENCAPSULATING LINER IS NOT ADDRESSED. SIMILAR TO ALTERNATIVE 1, IF LINER FAILURE OCCURS, UNCONTROLLED RELEASES OF PESTICIDE CONTAINING WASTE MATERIALS FROM THE STOCKPILE TO THE ENVIRONMENT AT THE SITE WOULD NOT BE PREVENTED.

EXCEPT AS A BASELINE CASE, THIS NO ACTION WITH PERIODIC MONITORING ALTERNATIVE IS INSTITUTIONALLY UNACCEPTABLE. PRESENT BASE WORTH COST OF THIS ALTERNATIVE WOULD BE \$386,000. INSTITUTIONAL CONTROL OF LAND USE WOULD BE REQUIRED INDEFINITELY.

ALTERNATIVE 3

UNDER ALTERNATIVE 3, AN ONSITE LANDFILL WOULD BE CONSTRUCTED IN FULL COMPLIANCE WITH RCRA REQUIREMENTS. THE WASTES IN THE STOCKPILE WOULD BE REMOVED AND HAULED TO THE NEW LANDFILL. DURING REMOVAL OF THE STOCKPILE, CONTAMINANTS MAY BE RELEASED FROM THE DISTURBED AREAS; HOWEVER, PAST EXPERIENCE WITH EXCAVATION OF THE MATERIAL ON SITE INDICATES THAT THE RISK OF AIR POLLUTION DURING THE REMOVAL OF THE STOCKPILED MATERIAL IS MINIMAL. SPECIAL CONSTRUCTION TECHNIQUES, IF NECESSARY, COULD BE IMPLEMENTED TO MINIMIZE THE EMISSIONS.

THE LANDFILL DESIGN WOULD CONFORM WITH RCRA AND OTHER ENVIRONMENTAL REGULATORY REQUIREMENTS. THE LANDFILL WOULD HAVE TWO LINERS FOR LEACHATE COLLECTION AND LEAK DETECTION ZONES. FOR PURPOSES OF THIS EVALUATION, A NEW LANDFILL LOCATION WAS PRELIMINARILY SELECTED BASED ON ACCESSIBILITY, BUFFER DISTANCE FROM THE GOLF COURSE, AVOIDANCE OF ALL KNOWN AND POTENTIAL WASTE SOURCES AND RESIDUAL CONTAMINATION AREAS AT THE SITE, AND THE EASE OF POST-CLOSURE MAINTENANCE AND MONITORING. THE LANDFILL WOULD BE CAPPED WITH A DOUBLE-LAYER PVC LINER. ADDITIONAL SOIL WITH A VEGETATIVE COVER WOULD BE PLACED ON TOP OF THE FINISHED LANDFILL.

AVERAGE THICKNESS OF THE LANDFILL WOULD BE 17 FEET. THE LANDFILL BOTTOM WOULD BE BELOW GRADE BUT ABOVE THE GROUNDWATER TABLE. LEACHATE GENERATED WOULD BE COLLECTED AND TREATED BY AN ONSITE ACTIVATED CARBON TREATMENT SYSTEM. AFTER TREATMENT, THE WATER WOULD BE DISCHARGED INTO THE LOCAL DRAINAGE DITCH AWAY FROM THE LANDFILL. THE SYSTEM WILL COMPLY WITH ARARS GOVERNING SURFACE WATER DISCHARGE PERMITS. SLUDGE WOULD BE COLLECTED AND DISPOSED IN AN OFFSITE RCRA-APPROVED LANDFILL.

THIS ALTERNATIVE WOULD REQUIRE APPROXIMATELY 12 MONTHS FOR SYSTEM PLANNING/DESIGN TO MEET ARARS AND AN ADDITIONAL 5-6 MONTHS FOR CONSTRUCTION. SHORT-TERM RISK TO USERS OF THE GOLF COURSE, RESIDENTS IN THE IMMEDIATE AREA OF THE FACILITY, AND REMEDIATION WORKERS WOULD EXIST DURING CONSTRUCTION OF THE LANDFILL. ALTHOUGH SOURCE CONTROL BY CONTAINMENT OF THE WASTE SUBSTANTIALLY REDUCES THE CHRONIC AND ACUTE HEALTH RISKS TO AREA RESIDENTS, THIS ALTERNATIVE DOES NOT REDUCE THE VOLUME OR TOXICITY OF THE WASTES. THIS ALTERNATIVE REQUIRES SIGNIFICANT INSTITUTIONAL CONTROL TO ENSURE THAT THE FACILITY IS NOT DISRUPTED BY DEVELOPMENT PLANNED IN CONJUNCTION WITH THE REST OF THE GOLF COURSE.

ENVIRONMENTAL EFFECTS DURING THE CONSTRUCTION PHASE INCLUDE;

- USE OF HEAVY EARTH MOVING EQUIPMENT WILL GENERATE FUGITIVE DUSTS, THUS INCREASING THE POTENTIAL FOR SPREADING PESTICIDE DUSTS INTO THE ENVIRONMENT; AND
- UNCONTROLLED RELEASES OF EXPOSED PESTICIDE WASTES VIA THE SURFACE WATER ROUTE DURING PRECIPITATION

SINCE HAZARDOUS SUBSTANCES WOULD REMAIN ON SITE, A REVIEW OF THE SITE WOULD TAKE PLACE ONCE EVERY FIVE YEARS. BASE PRESENT WORTH COST FOR THIS ALTERNATIVE IS ESTIMATED TO BE \$11,498,000.

ALTERNATIVE 4

UNDER THIS ALTERNATIVE, THE WASTE PILE WOULD BE EXCAVATED USING FRONT-END LOADERS, DUMPED INTO TRUCKS, MANIFESTED AND HAULED FOR FINAL DISPOSAL AT AN OFFSITE LANDFILL, MEETING RCRA REQUIREMENTS. THE 20-CUBIC YARD CAPACITY TRUCKS USED WOULD BE EQUIPPED WITH TARPS TO PREVENT SPILLAGE AND TO MINIMIZE AIR ENTRAINMENT OF THE CONTAMINANTS.

THE RESPONSIBILITY FOR COMPLETE REGULATORY/ENVIRONMENTAL COMPLIANCE AT THE SELECTED LANDFILL WOULD REST WITH ITS OWNER/OPERATOR.

THIS ALTERNATIVE WILL REDUCE OR ELIMINATE FUTURE CONTAMINATION BY REMOVING THE SOURCE. THE TOTAL VOLUME OF MATERIALS AND WASTES TO BE DISPOSED OFFSITE IS ESTIMATED TO BE ABOUT 22,000 CUBIC YARDS. IT IS ESTIMATED THAT THIS ALTERNATIVE WOULD TAKE ABOUT 6 MONTHS FOR PROCURING OFFSITE DISPOSAL SERVICES AND AN ADDITIONAL 3-4 MONTHS FOR FULL IMPLEMENTATION.

SHORT-TERM RISK IS ASSOCIATED WITH THE ONSITE REMOVAL AND TRANSPORTATION OF WASTE MATERIALS FROM THE STOCKPILE TO THE OFFSITE LANDFILL. THE TYPES AND DEGREE OF RISK DURING IMPLEMENTATION UNDER THIS ALTERNATIVE WILL BE SIMILAR BUT OF SHORTER DURATION THAN THOSE UNDER ALTERNATIVE 3, BECAUSE THE IMPLEMENTATION PERIOD FOR ONSITE REMEDIAL ACTIVITIES FOR THIS ALTERNATIVE WILL BE SHORTER THAN THAT FOR ALTERNATIVE 3. SINCE THE WASTE MATERIAL WOULD BE REMOVED FROM THE SITE UNDER THIS ALTERNATIVE, THE CHRONIC AND ACUTE HEALTH RISKS TO THE NEARBY RESIDENTS WOULD BE SUBSTANTIALLY REDUCED. ALTHOUGH, THE RCRA-PERMITTED LANDFILL DOES CONTAIN THE WASTE MATERIALS AND CONFIRMS THEIR LONG-TERM CONFINEMENT BY MONITORING, IT DOES NOT REDUCE THE TOXICITY OR VOLUME OF THE WASTES.

ENVIRONMENTAL RISKS ASSOCIATED WITH THIS ALTERNATIVE ARE THE SAME AS THOSE FOR ALTERNATIVE 3 DURING THE EXCAVATION OF THE STOCKPILE. AN ADDITIONAL RISK OF ENVIRONMENTAL EXPOSURE IS ASSOCIATED WITH POSSIBLE FUGITIVE EMISSIONS AND SPILLS FROM VEHICLES IN TRANSIT TO THE DISPOSAL FACILITY.

OF MAJOR IMPORTANCE IN DETERMINING THE COST OF THE OFFSITE LANDFILL ALTERNATIVE IS THE DISTANCE TO THE SELECTED RCRA-APPROVED LANDFILL. FOR COST ESTIMATING PURPOSES, IT IS ASSUMED THAT THE ONE-WAY TRUCK MILEAGE WOULD BE ON THE AVERAGE OF 400 MILES. THE BASE PRESENT WORTH COST IS ESTIMATED TO BE \$10,043,000.

ALTERNATIVE 5

THIS ALTERNATIVE CONSIDERED ONSITE THERMAL TREATMENT OF THE WASTE MATERIALS IN THE STOCKPILE AND OFFSITE RCRA LAND DISPOSAL OF RESIDUAL ASH. THE STOCKPILE WOULD BE TRANSFERRED TO A WASTE HOMOGENIZING AREA WHERE THEY WILL BE FURTHER MIXED AND HOMOGENIZED BY USE OF POWER-SCREENS. THE EXCAVATED WASTE MATERIALS WILL BE THERMALLY TREATED IN AN ONSITE MOBILE THERMAL TREATMENT FACILITY. OPERATION OF THE THERMAL TREATMENT FACILITY WILL BE IN COMPLIANCE WITH RCRA REGULATIONS (PARTICULARLY, SUBPART 0, 40 CFR 264) AND WILL COMPLY WITH ALL REQUIRED RCRA PERFORMANCE STANDARDS.

EXCESS QUENCHING WATER AND SCRUBBER WATER, IF ANY, WILL BE REINJECTED INTO THE FACILITY FOR TREATMENT. AIR POLLUTION CONTROL WASTES OR SLUDGES WILL BE REINJECTED INTO THE THERMAL TREATMENT FACILITY FOR FURTHER TREATMENT. RESIDUAL ASHES WILL BE COLLECTED AND TRANSPORTED TO AN OFFSITE RCRA-APPROVED LANDFILL FOR FINAL DISPOSAL. AIR POLLUTION CONTROL SYSTEMS WILL BE UTILIZED TO REMOVE BY-PRODUCTS AND NON-COMBUSTIBLE MATERIALS FROM THE GAS STREAM.

EPA'S EMERGENCY RESPONSE SECTION PERFORMED AN ONSITE TEST BURN UTILIZING A MOBILE ROTARY KILN INCINERATOR IN DECEMBER 1986 AT THE SITE. PESTICIDES IN THE SOIL FED TO THE INCINERATOR WERE EFFECTIVELY REMOVED AS EVIDENCED BY DISAPPEARANCE OF THE POHCS, ALPHA-BHC AND DDT. A PROPERLY DESIGNED AND OPERATED INCINERATOR WITH AN AIR POLLUTION CONTROL SYSTEM AND ASH MANAGEMENT SYSTEM WILL MEET ACTION-SPECIFIC ARARS. THE EVALUATION OF THE OFFSITE LANDFILLING OF RESIDUAL ASH IS RELATIVELY THE SAME AS THAT PRESENTED IN ALTERNATIVE 4, EXCEPT THAT THE VOLUME OF ASH NEEDING TO BE DISPOSED UNDER ALTERNATIVE 5 WILL BE SLIGHTLY LESS THAN THAT FOR ALTERNATIVE 4.

NEARLY COMPLETE DESTRUCTION OF CHLORINATED ORGANO-PESTICIDES WITH HIGH DESTRUCTION AND REMOVAL EFFICIENCY (DRE) CAN BE ACHIEVED BY USING THE THERMAL TREATMENT TECHNOLOGY. FOR THE SUBJECT STOCKPILE, BECAUSE OF THE HIGH SOIL CONTENT OF THE WASTES, THE REDUCTION IN PHYSICAL VOLUME IS

NOT EXPECTED TO BE HIGH. HOWEVER, NEARLY TOTAL DESTRUCTION OF HAZARDOUS CONSTITUENTS CAN BE READILY TRANSLATED INTO CHEMICAL-SPECIFIC VOLUME REDUCTION. THUS, THE WASTES CONTAINING ORGANIC PESTICIDES WOULD BE DESTROYED.

THE USE OF MOBILE THERMAL TREATMENT FACILITIES FOR THE DESTRUCTION OF PESTICIDE CONTAMINANTS IN SOLID OR SEMI-SOLID WASTES SIMILAR TO THOSE IN THE STOCKPILE HAS BEEN WELL DEMONSTRATED TO BE AN EFFECTIVE AND RELIABLE PROCESS. THE 1986 TEST BURN RESULTS INDICATED THAT APPLICABLE PERFORMANCE STANDARDS WERE AND CAN BE MET WITH THE USE OF A MOBILE THERMAL TREATMENT FACILITY. ALTHOUGH THE FS IDENTIFIED THE ROTARY KILN AS THE MOST APPROPRIATE INCINERATOR FOR PROCESSING THE WASTE IN THE STOCKPILE, ALL TYPES OF INCINERATORS WILL BE CONSIDERED DURING THE REMEDIAL ACTION CONTRACT BIDDING AND SELECTION PROCESS TO ENSURE SELECTION OF THE MOST EFFECTIVE INCINERATOR TECHNOLOGY AVAILABLE.

SHORT-TERM HEALTH RISKS ASSOCIATED WITH EXCAVATING THE STOCKPILE WOULD BE THE SAME AS THOSE DESCRIBED FOR ALTERNATIVE 3. BECAUSE OF THE ONSITE THERMAL TREATMENT OF THE WASTES IN THE STOCKPILE, THE DURATION OF EXPOSURE TO THE WASTES WOULD BE CONSIDERABLY LENGTHENED FOR THIS ALTERNATIVE COMPARED WITH ON-OR OFFSITE LANDFILLING OPERATIONS UNDER ALTERNATIVES 3 AND 4. RESIDUAL RISK TO THE GENERAL PUBLIC WOULD BE SIGNIFICANTLY REDUCED. THE ASSOCIATED ENVIRONMENTAL IMPACTS OF THIS ALTERNATIVE ARE CONSIDERED TO BE MINOR.

IT IS ESTIMATED THAT THIS ALTERNATIVE WILL TAKE ABOUT 6 MONTHS FOR PROCURING AN ON SITE MOBILE THERMAL TREATMENT FACILITY AND AN ADDITIONAL 13 1/2 MONTHS FOR SYSTEM START-UP, TESTING, THERMAL TREATMENT, AND DEMOBILIZATION. OFF SITE DISPOSAL WOULD COINCIDE WITH THE THERMAL TREATMENT OPERATION. INSTITUTIONAL CONTROLS ON LAND USE WOULD NOT BE REQUIRED. PRESENT BASE WORTH COST IS CALCULATED TO BE \$20,645,000.

ALTERNATIVE 6

THIS ALTERNATIVE IS THE SAME AS ALTERNATIVE 5 WITH THE EXCEPTION THAT THE THERMAL TREATMENT ASH WOULD BE DISPOSED OF IN A PERMANENT ONSITE RCRA-COMPLIANCE LANDFILL. THE ONSITE THERMAL TREATMENT WOULD BE THE SAME AS DEFINED IN ALTERNATIVE 5. THE ONSITE LANDFILL DESIGN WOULD CONFORM WITH ALL RCRA REQUIREMENTS. CONSTRUCTION DETAILS ARE THE SAME AS THOSE PRESENTED IN ALTERNATIVE 3.

DIFFERENCES BETWEEN THIS ALTERNATIVE AND ALTERNATIVE 3 ARE;

- IT INVOLVES THE LANDFILLING OF RESIDUAL ASH, WHICH IS STABILIZED, RELATIVELY INERT, NON-HAZARDOUS, NON-REACTIVE, AND POSSIBLY NON-CORROSIVE COMPARED WITH UNTREATED WASTES TO BE LAND-DISPOSED UNDER ALTERNATIVE 3; AND
- THE TOTAL VOLUME OF ASH TO BE DISPOSED UNDER THIS ALTERNATIVE IS SLIGHTLY LESS THAN THE VOLUME OF UNTREATED WASTES UNDER ALTERNATIVE 3.

THE ONSITE THERMAL TREATMENT FACILITY WOULD HAVE THE SAME LEVEL OF PERFORMANCE AND RELIABILITY AS THAT MENTIONED IN THE DISCUSSION UNDER ALTERNATIVE 5.

HEALTH RISKS ASSOCIATED WITH THE EXCAVATION AND ONSITE THERMAL TREATMENT OF THE WASTE MATERIALS FROM THE STOCKPILE WILL BE THE SAME AS THOSE DESCRIBED FOR ALTERNATIVE 5. INSTITUTIONAL CONTROL OF LAND USE WOULD BE REQUIRED INDEFINITELY.

IT IS ESTIMATED THAT THIS ALTERNATIVE WILL TAKE ABOUT 6 MONTHS FOR PROCURING AN ONSITE MOBILE THERMAL TREATMENT SYSTEM AND 1.5 YEARS TO COMPLETELY IMPLEMENT THIS ALTERNATIVE. THE BASE PRESENT WORTH IS \$20,770,000.

ALTERNATIVE 7

THIS ALTERNATIVE CONSIDERS OFFSITE THERMAL TREATMENT OF WASTE AND OFFSITE DISPOSAL OF RESIDUAL ASH. THE OFFSITE THERMAL TREATMENT FACILITY WOULD BE REQUIRED TO HAVE THE SAME PERFORMANCE STANDARDS AND DESIGN CRITERIA CONSIDERED UNDER ALTERNATIVE 5 FOR THE ONSITE THERMAL TREATMENT ACTIVITIES.

THE THERMAL TREATMENT AND LANDFILL TECHNOLOGY FOR THIS ALTERNATIVE IS ENGINEERINGLY SOUND, ASSUMING THE OFFSITE FACILITY IS PROPERLY DESIGNED, OPERATED, AND MAINTAINED DURING ITS OPERATION AND IS PROPERLY CLOSED AT THE END OF ITS SERVICE LIFE IN ACCORDANCE WITH RCRA REGULATIONS AND OTHER GOVERNING ENVIRONMENTAL LAWS AND REGULATIONS. THE THERMAL TREATMENT FACILITY WOULD BE RESPONSIBLE FOR DISPOSAL OF RESIDUAL ASH IN A RCRA-APPROVED LAND DISPOSAL FACILITY.

PERFORMANCE OF THE OFFSITE THERMAL TREATMENT AND SELECTED OFFSITE LANDFILL ALTERNATIVE IS ANTICIPATED TO BE ESSENTIALLY THE SAME AS THE PERFORMANCE LEVEL DISCUSSED UNDER ALTERNATIVE 5.

POTENTIAL SHORT-AND LONG-TERM HEALTH EFFECTS OR RISKS ASSOCIATED WITH THIS ALTERNATIVE WOULD BE ESSENTIALLY THE SAME AS FOR ALTERNATIVE 4. HOWEVER, THE MAGNITUDE OF RISK ASSOCIATED WITH OFFSITE LANDFILLING UNDER THIS ALTERNATIVE WILL BE MUCH LESS THAN THAT FOR ALTERNATIVE 4, BECAUSE THE RESIDUAL ASH WOULD BE MUCH LESS HAZARDOUS THAN THE UNTREATED WASTE TO BE HANDLED UNDER ALTERNATIVE 4.

IT IS ESTIMATED THAT THIS ALTERNATIVE WILL TAKE ABOUT 6 MONTHS FOR PROCURING OFFSITE REMOVAL AND THERMAL TREATMENT SERVICES AND AN ADDITIONAL 6-8 MONTHS FOR COMPLETE IMPLEMENTATION.

ONE OF THE MOST SIGNIFICANT FACTORS CONCERNING THE FEASIBILITY OF OFFSITE THERMAL TREATMENT IS THE COST ASSOCIATED WITH THE DISTANCE REQUIRED TO TRANSPORT THE WASTE MATERIALS TO THE DESIGNATED TREATMENT FACILITY. FULL ENFORCEMENT OF THE LAND DISPOSAL RESTRICTIONS HAS LED TO A GREAT SURGE IN THE DEMAND FOR PERMITTED COMMERCIAL HAZARDOUS THERMAL TREATMENT FACILITIES.

THE ONLY POTENTIAL CANDIDATE OFFSITE THERMAL TREATMENT FACILITY IDENTIFIED IS THE ROLAND FACILITY IN TEXAS AT ABOUT 1,300 MILES FROM THE SITE. BASE PRESENT WORTH COST IS CALCULATED TO BE \$75,969,000.

ALTERNATIVE 8

THIS ALTERNATIVE IS THE SAME AS ALTERNATIVE 6 WITH THE EXCEPTION THAT THE RESIDUAL ASH WILL BE DISPOSED OF IN A PERMANENT ON-SITE NON-RCRA LANDFILL. THE ON-SITE THERMAL TREATMENT PORTION OF THIS ALTERNATIVE WILL BE THE SAME ONE AS WAS DEFINED IN ALTERNATIVE 5. THE ON-SITE LANDFILL LOCATION WOULD BE DETERMINED IN THE REMEDIAL DESIGN PHASE.

PERFORMANCE AND RELIABILITY WOULD BE THE SAME AS THAT FOR ALTERNATIVE 5 AND WOULD DISPLAY A HIGHER LEVEL OF PERFORMANCE AND RELIABILITY THAN ALTERNATIVE 4, WHICH DEALS WITH RCRA DISPOSAL OF UNTREATED WASTES. THIS ALTERNATIVE WOULD TAKE ABOUT 6 MONTHS TO PROCURE AN ON-SITE MOBILE THERMAL TREATMENT FACILITY AND AN ADDITIONAL 13 1/2 MONTHS TO COMPLETE THE REMEDIAL ACTION.

THE RESIDUAL ASH WOULD BE SAMPLED AND ANALYZED TO VERIFY THE ASH IS NON-HAZARDOUS, AS DETERMINED BY RCRA EP TOXICITY TESTS. THE ASH WOULD ALSO BE SAMPLED AND ANALYZED FOR TOTAL METALS TO VERIFY METAL CONCENTRATION IN THE ASH IS NOT OCCURRING. THE ON-SITE LAND DISPOSAL OF RESIDUAL ASH WOULD OCCUR CONCURRENTLY WITH THE THERMAL TREATMENT OPERATION.

SHORT-TERM HEALTH RISKS UNDER THIS ALTERNATIVE WOULD BE ASSOCIATED WITH THE EXCAVATION OF THE STOCKPILE AND ONSITE THERMAL TREATMENT OF THE WASTE MATERIALS AND WOULD BE THE SAME AS THOSE DESCRIBED FOR ALTERNATIVE 5. RESIDUAL OR LONG-TERM HEALTH RISKS ARE MINIMAL SINCE THE RESIDUAL ASH TO BE LANDFILLED IS NON-HAZARDOUS.

ENVIRONMENTAL IMPACTS ASSOCIATED WITH EXCAVATION AND THERMAL TREATMENT WILL BE THE SAME AS THOSE DESCRIBED FOR ALTERNATIVE 5. EFFECTS ASSOCIATED WITH THE ON-SITE LANDFILL WOULD BE SIMILAR TO BUT MUCH LESS THAN THOSE DESCRIBED FOR ALTERNATIVE 3. NO LONG-TERM HEALTH EFFECTS WILL RESULT FROM THIS ALTERNATIVE.

BASE PRESENT WORTH COST FOR THIS ALTERNATIVE IS ESTIMATED TO BE \$14,533,000.

6.2 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

TABLE 5 WAS DEVELOPED FOR COMPARISON OF THE VARIOUS REMEDIAL ACTION ALTERNATIVES AGAINST THE

NINE CRITERIA OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT, COMPLIANCE WITH ARARS, LONG-TERM EFFECTIVENESS AND PERMANENCE, REDUCTION OF TOXICITY, MOBILITY AND VOLUME, SHORT-TERM EFFECTIVENESS, IMPLEMENTABILITY, COST, AND STATE AND COMMUNITY ACCEPTANCE.

#SR

7.0 THE SELECTED REMEDY

THE SELECTED REMEDY IS ALTERNATIVE 8. THIS OPERABLE UNIT WILL INITIATE ACTION AT THE SITE WHILE ADDITIONAL INFORMATION IS DEVELOPED AND EVALUATED FOR OPERABLE UNIT ONE. THE SELECTED REMEDY INCLUDES;

- EXCAVATION OF PESTICIDE-CONTAMINATED SOIL AND DEBRIS FROM THE STOCKPILE, TRANSFER OF THE WASTE MATERIALS TO A TEMPORARY WASTE FEED HOMOGENIZING AREA AND HOMOGENIZE THEM;
- THERMAL TREATMENT OF 22,000 CUBIC YARDS OF THE HOMOGENIZED WASTES IN A RCRA-COMPLIANCE ON-SITE MOBILE THERMAL TREATMENT FACILITY;
- ON-SITE TREATMENT OF PROCESS WASTEWATER OR SCRUBBER BLOWDOWN SLUDGE BY REINJECTION INTO THE THERMAL TREATMENT FACILITY;
- SAMPLE COLLECTION AND ANALYSIS OF THE RESIDUAL ASH TO CONFIRM THE EFFECTIVENESS OF THERMAL TREATMENT TECHNOLOGY; AND
- ON-SITE DISPOSAL OF THE RESIDUAL ASH WHICH IS STABILIZED, RELATIVELY INERT, NON-HAZARDOUS, NON-REACTIVE AND NON-CORROSIVE.

OPERATION OF A MOBILE THERMAL TREATMENT FACILITY WILL BE IN COMPLIANCE WITH RCRA REGULATIONS (PARTICULARLY, SUBPART O, 40 CFR 264) AND WILL COMPLY WITH ALL REQUIRED RCRA PERFORMANCE STANDARDS. THE MOBILE THERMAL TREATMENT FACILITY AND ITS AIR POLLUTION CONTROL TRAIN WILL BE OPERATED SO THAT;

- THE THERMAL TREATMENT FACILITY WILL BE CAPABLE OF ACHIEVING A DESTRUCTION AND REMOVAL EFFICIENCY (DRE) OF 99.99% FOR ALL DESIGNATED PRINCIPAL ORGANIC HAZARDOUS CONSTITUENTS (POHCS); AND;
- THE AIR POLLUTION CONTROL SYSTEM WILL ACHIEVE PERFORMANCE STANDARDS, WHICH ARE DEFINED AS (1) HYDROGEN CHLORIDE LESS THAN 4 POUNDS PER HOUR AND (2) PARTICULATE MATTER OF LESS THAN 0.08 GRAINS PER DRY CUBIC FOOT IN THE EXHAUST GAS CORRECTED TO 7 PERCENT OXYGEN CONTENT.

UNDER THIS ALTERNATIVE, THE CLOSURE PLAN FOR REMEDIATION OF THIS OPERABLE UNIT WILL PROVIDE FOR;

- DEMOBILIZATION OF THE ONSITE MOBILE THERMAL TREATMENT FACILITY, THE AIR POLLUTION CONTROL SYSTEM, AND MISCELLANEOUS SUPPORT COMPONENTS;
- DECONTAMINATION AND DECOMMISSIONING OF THE TEMPORARY STORAGE AREA AND MISCELLANEOUS TANKS AND SUPPORT EQUIPMENT; AND
- REVEGETATION OF DISTURBED AREAS

ALTHOUGH THE ACTUAL ACQUISITION OF A FEDERAL OR STATE OPERATIONAL PERMIT UNDER CERCLA/SARA §121(E) FOR THE ON-SITE SUPERFUND THERMAL TREATMENT FACILITY WOULD NOT BE REQUIRED, ALL OF THE REGULATORY REQUIREMENTS EQUIVALENT TO THE PERMIT CONDITIONS MUST BE MET. THERMAL TREATMENT WILL DESTROY PESTICIDES IN THE STOCKPILE AND THUS ELIMINATE FURTHER EXPOSURE. AIR EMISSIONS FROM THE TREATMENT FACILITY WOULD BE CONTROLLED IN TOTAL COMPLIANCE WITH APPLICABLE EMISSION STANDARDS AND REGULATIONS. THEREFORE, NO SIGNIFICANT HEALTH RISKS FROM AIR EMISSIONS IS PROJECTED.

THE ONSITE LAND DISPOSAL OF RESIDUAL ASH WILL OCCUR CONCURRENTLY WITH THE THERMAL TREATMENT OPERATION. CLEANUP CRITERIA ESTABLISHED FOR THE STOCKPILE ARE TO BACKGROUND LEVELS WHICH WILL

BE PROTECTIVE, AND THE RCRA EP TOXICITY LEVELS ESTABLISHED IN 40 CFR 261.24. LAND DISPOSAL RESTRICTIONS WILL NOT APPLY. SPECIFICALLY, THESE RESTRICTIONS WILL NO LONGER BE AN ARAR FOR THE RESIDUAL ASH BECAUSE THE ASH FROM THE THERMAL TREATMENT OF THE CONTAMINATED SOIL AND DEBRIS WILL NOT BE EP TOXIC AND THE HOC LEVEL WILL BE REDUCED FAR BELOW 1000 MG/KG BY THE REQUIRED TECHNOLOGY OF THERMAL TREATMENT (40 CFR 3 268.32 AND 268.42). LDR ARE NOT RELEVANT AND APPROPRIATE WHEN CERCLA CONTAMINATED SOIL AND DEBRIS CONTAIN NO RESTRICTED WASTE, UNTIL SUCH TIME AS SEPARATE TREATMENT STANDARDS FOR SOIL AND DEBRIS ARE PROMULGATED (OSWER DIRECTIVE NO. 9347.2-01, JUNE 5, 1989). ON THIS BASIS, RESIDUAL ASH FROM TREATMENT OF THE SOIL AND DEBRIS WOULD NOT BE SUBJECT TO LDR. THE ASH, FLY ASH, AND/OR SLUDGE, AFTER TESTING FOR CONFIRMATION OF COMPLIANCE WITH RCRA CORROSIVITY AND EPA TOXICITY STANDARDS AND CONFORMITY TO BACKGROUND LEVELS, WILL BE DISPOSED OF IN AN ONSITE, BELOW-GRADE LANDFILL. BACKGROUND LEVELS AT THE FAIRWAY SIX DISPOSAL SITE HAVE BEEN DETERMINED TO CONTAIN 2.3 MG/KG TOTAL PESTICIDES.

AS A CONDITION OF STATE CONCURRENCE (SEE ATTACHMENT 2) THE REMEDIAL DESIGN WILL INVOLVE SAMPLE COLLECTION AND ANALYSIS OF ONSITE RESIDUAL ASH FROM THE 1986 TEST BURN. THE TCLP EXTRACTION METHOD WILL BE USED TO DETERMINE IF CLEANUP TO DRINKING WATER STANDARDS IS AN APPROPRIATE CLEANUP CRITERIA. AFTER THERMAL TREATMENT OF THE CONTAMINATED SOIL AND DEBRIS, IF SAMPLE ANALYSIS REVEALS THAT THE MATERIAL IN THE STOCKPILE REMAIN HAZARDOUS, THEY WILL BE DISPOSED OF IN AN OFF-SITE RCRA PERMITTED HAZARDOUS WASTE FACILITY. LIKEWISE, ANY HAZARDOUS SUBSTANCES WHICH CANNOT BE THERMALLY DESTROYED (DRUMS, UNSCREENABLE METAL MATERIAL, ETC.) WILL ALSO BE DISPOSED OF OFFSITE.

THIS ALTERNATIVE WILL TAKE ABOUT 6 MONTHS TO PROCURE AN ON-SITE MOBILE THERMAL TREATMENT FACILITY AND AN ADDITIONAL 13 1/2 HALF MONTHS TO COMPLETE THE REMEDIAL ACTION. COST FOR THIS ALTERNATIVE IS ESTIMATED TO BE \$14,533,000. TABLE 7 PROVIDES A BREAKDOWN OF THE COST ESTIMATE FOR THIS ALTERNATIVE.

#SD

8.0 STATUTORY DETERMINATIONS

THE US EPA AND THE NORTH CAROLINA SOLID WASTE MANAGEMENT SECTION BELIEVE THAT THIS REMEDY WILL SATISFY THE STATUTORY REQUIREMENTS OF PROVIDING PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT, ATTAIN APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OF OTHER ENVIRONMENTAL STATUTES, WILL BE COST-EFFECTIVE AND WILL UTILIZE PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE.

8.1 PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

THE SELECTED REMEDY, ALTERNATIVE 8, PROVIDES ADEQUATE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT BY PERMANENTLY ELIMINATING THE PESTICIDE CONTAMINANTS FOUND IN THE SOIL AND DEBRIS IN THE EXISTING STOCKPILE.

THERMAL TREATMENT OF THE CONTAMINATED MATERIAL IN A RCRA-APPROVED FACILITY ON-SITE WILL ELIMINATE THE THREAT OF PUBLIC EXPOSURE TO THE PESTICIDE CONTAMINANTS IN THE STOCKPILE. THE USE OF PROPER AIR POLLUTION CONTROL DEVICES AND PROPER HANDLING OF SCRUBBER WATER AND RESIDUAL ASH WILL FURTHER REDUCE THE RELEASE OF SITE CONTAMINANTS INTO THE ENVIRONMENT.

NO UNACCEPTABLE SHORT-TERM RISKS OR CROSSMEDIA EFFECTS WILL BE CAUSED BY THE IMPLEMENTATION OF THE REMEDY.

8.2 ATTAINMENT OF ARARS

THE SELECTED REMEDY WILL ATTAIN FEDERAL AND STATE ARARS. THE THERMAL TREATMENT TECHNOLOGY WILL ATTAIN THE RCRA REQUIREMENTS UNDER 40 CFR SS 264.340, 264.341, 264.342, 264.343, 264.345. TECHNOLOGICAL REQUIREMENTS OF LAND DISPOSAL RESTRICTION REGULATIONS ARE BEING CONSIDERED IN SELECTION OF THERMAL TREATMENT TECHNOLOGY; THIS TECHNOLOGY WILL ATTAIN RCRA REQUIREMENTS UNDER 40 CFR §§ 268.32 AND 268.42.

8.3 COST EFFECTIVENESS

ALTERNATIVE 8 IS THE MOST COST-EFFECTIVE ALTERNATIVE THAT PROVIDES PROTECTION TO PUBLIC HEALTH AND THE ENVIRONMENT IN THE SHORT-AND LONG-TERM AND MEETS OR EXCEEDS ALL ARARS.

THIS REMEDY IS A PROVEN TECHNOLOGY AND CAN BE READILY IMPLEMENTED. THIS ALTERNATIVE USES A TECHNOLOGY WHICH IS PROVEN FOR THE PERMANENT DESTRUCTION OF ORGANIC CONTAMINANTS. TEST RESULTS FROM THE 1986 TRIAL TEST BURN AT THE SITE INDICATE THAT APPLICABLE PERFORMANCE STANDARDS WERE AND CAN BE MET.

ONSITE THERMAL TREATMENT AND ONSITE DISPOSAL OF RESIDUAL ASH PROVIDES A PERMANENT, ONSITE SOLUTION, WOULD NOT REQUIRE LONG-TERM ENVIRONMENTAL MONITORING AND REPRESENTS A REASONABLE VALUE FOR THE MONEY.

8.4 UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

THE ALTERNATIVE SELECTED PROVIDES A COST-EFFECTIVE LONG-TERM PERMANENT REMEDY, WHICH WILL SIGNIFICANTLY AND RELIABLY REDUCE THE TOXICITY AND MOBILITY OF HAZARDOUS CONTAMINANTS OF CONCERN AT THE SITE TO A LEVEL THAT IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT. BECAUSE OF THE HIGH SOIL CONTENT OF THE WASTES, PHYSICAL VOLUME REDUCTION IS NOT EXPECTED TO BE HIGH.

8.5 PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

THIS ALTERNATIVE DOES OFFER OPPORTUNITIES TO MEET THE THREE PRINCIPAL CERCLA/SARA AND NCP OBJECTIVES OF REDUCING WASTE VOLUME, TOXICITY, AND MOBILITY BY WAY OF THE THERMAL TREATMENT TECHNOLOGY. THE THERMAL TREATMENT TECHNOLOGY IS THE BEST DEMONSTRATED AVAILABLE TECHNOLOGY FOR ELIMINATING ORGANIC CONTAMINANTS AND THEIR TOXICITY AND, CONSEQUENTLY, THE ASSOCIATED ENVIRONMENTAL MOBILITY PROBLEM.

FINAL RESPONSIVENESS SUMMARY

THE US ENVIRONMENTAL PROTECTION AGENCY (EPA) ESTABLISHED A PUBLIC COMMENT PERIOD FROM MAY 16, 1989 THROUGH JUNE 6, 1989 FOR INTERESTED PARTIES TO COMMENT ON EPA'S PROPOSED REMEDIAL ACTION PLAN FOR THE SECOND OPERABLE UNIT AT THE FAIRWAY SIX DISPOSAL SITE.

EPA HELD A PUBLIC HEARING ON MAY 16, 1989 IN ABERDEEN, NORTH CAROLINA TO DESCRIBE THE REMEDIAL ALTERNATIVES DEVELOPED AND PRESENT EPA'S PREFERRED REMEDIAL ALTERNATIVE FOR THE FAIRWAY SIX DISPOSAL SITE.

A RESPONSIVENESS SUMMARY IS REQUIRED BY SUPERFUND POLICY FOR THE PURPOSE OF PROVIDING EPA AND THE PUBLIC WITH A SUMMARY OF CITIZEN COMMENTS AND CONCERNS ABOUT THE SITE, AS RAISED DURING THE PUBLIC COMMENT PERIOD, AND EPA'S COMMENTS TO THOSE CONCERNS. ALL OF THE COMMENTS SUMMARIZED IN THIS DOCUMENT HAVE BEEN FACTORED INTO EPA'S FINAL DECISION.

THIS RESPONSIVENESS SUMMARY FOR THE FAIRWAY SIX DISPOSAL SITE IS DIVIDED INTO THE FOLLOWING SECTIONS.

- BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS. THIS SECTION PROVIDES A BRIEF HISTORY OF COMMUNITY INTEREST AND CONCERNS RAISED DURING REMEDIAL PLANNING ACTIVITIES AT THE FAIRWAY SIX DISPOSAL SITE.
- SUMMARY OF THE MAJOR QUESTIONS AND COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA RESPONSES. THIS SECTION PRESENTS BOTH ORAL AND WRITTEN COMMENTS SUBMITTED TO EPA DURING THE PUBLIC COMMENT PERIOD, AND PROVIDES EPA'S RESPONSE TO THESE COMMENTS.
- CORRESPONDENCE. THIS SECTION SERVES AS AN ATTACHMENT FOR CORRESPONDENCE RECEIVED AND RESPONDED TO DURING THE PUBLIC COMMENT PERIOD.

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

THE ABERDEEN COMMUNITY HAS BEEN AWARE OF THE PESTICIDE CONTAMINATION PROBLEM AT THE FAIRWAY SIX DISPOSAL SITE FOR A NUMBER OF YEARS. IN RESPONSE TO A TIP FROM AN EMPLOYEE OF THE TOWN OF ABERDEEN, THE N.C. SOLID AND HAZARDOUS WASTE MANAGEMENT BRANCH INVESTIGATED THE SITE FOR SURFACE AND SUBSURFACE SOIL CONTAMINATION IN OCTOBER 1984. THEN IN JULY 1985, THE U.S. EPA REGION IV CONDUCTED THE FIRST OF TWO REMOVAL ACTIONS AT THE SITE TO ELIMINATE SURFACE AND SUBSURFACE CONTAMINATION.

COMMUNITY INVOLVEMENT WITH THE SITE INCREASED AFTER EPA ANNOUNCED THAT SUPERFUND FINANCED CLEANUP OF THE SITE WOULD TAKE PLACE. NEWSPAPER AND TELEVISION COVERAGE OF THE CLEANUP ACTIVITIES WAS EXTENSIVE DURING THE REMOVAL ACTIVITIES AND HELPED TO BROADEN THE LEVEL OF INTEREST ON A REGIONAL AS WELL AS LOCAL SCALE. IN DECEMBER 1986, A TRIAL TEST BURN WAS CONDUCTED AT THE SITE. PRIOR TO THE TRIAL BURN, APPROXIMATELY TWENTY-FIVE (25) FEDERAL, STATE AND LOCAL OFFICIALS MET IN ABERDEEN TO DISCUSS THE TEST BURN. THE PUBLIC WAS INVITED TO THIS MEETING AND QUESTIONS CONCERNING THE TEST BURN WERE RECEIVED FROM THE PUBLIC AND WERE RESPONDED TO BY EPA OFFICIALS. SOME OF THE CONCERNS EXPRESSED BY CITIZENS DURING THIS MEETING INCLUDED ATMOSPHERIC CONTAMINATION AS A RESULT OF THE TEST BURN, EFFECT OF LINDANE IN MUNICIPAL WELL NO. 1, THE FREQUENCY OF TESTING OF THE ABERDEEN WATER SUPPLY SYSTEM, AND THE EXTENT TO WHICH THE CONTAMINANTS HAD TRAVELED.

A PUBLIC MEETING FOLLOWED ON MARCH 12, 1987 TO DISCUSS RESULTS OF THE TRIAL TEST BURN. THIS PUBLIC MEETING WAS SPONSORED BY THE LEAGUE OF WOMEN VOTERS OF MOORE COUNTY-HAZARDOUS WASTE UNIT AND THE PURPOSE OF THE MEETING WAS TO INFORM THE PUBLIC OF PAST ACTIVITIES, INCLUDING THE TRIAL BURN RESULTS, AND ANTICIPATED FUTURE ACTIVITIES. EPA STAFF PROVIDED ANSWERS TO QUESTIONS AND DISCUSSED AVAILABLE DATA ON THE SITE.

THE SECOND RESPONSE ACTION TOOK PLACE FROM AUGUST 1988 THROUGH OCTOBER 1988. THIS RESPONSE ACTION INVOLVED EXCAVATION OF FOUR TRENCHES CONTAINING PESTICIDE CONTAMINATED SOIL AND DEBRIS.

AN AVAILABILITY SESSION WAS HELD ON JULY 18, 1988 TO INFORM LOCAL CITIZENS OF THE RI/FS PROCESS, DISCUSS THE UPCOMING REMOVAL ACTIVITIES, AND TO ANSWER ANY QUESTIONS OR CONCERNS THE CITIZENS MAY HAVE EXPRESSED. OF MOST CONCERN TO THE CITIZENS WAS THE THREAT OF PESTICIDE CONTAMINATION TO THEIR DRINKING WATER, CHRONIC HEALTH EFFECTS OF PESTICIDES AND ENFORCEMENT ACTION BEING TAKEN AGAINST THE POTENTIALLY RESPONSIBLE PARTIES (PRPS). A GOOD JOB WAS DONE IN INFORMING THOSE THAT WERE INTERESTED IN THE SITE AND NO ONE APPEARED TO HAVE LEFT THE MEETING UNSATISFIED.

ON MAY 16, 1989, A PUBLIC MEETING WAS HELD IN ABERDEEN AT THE ABERDEEN MIDDLE SCHOOL TO PRESENT TO THE PUBLIC EPA'S PROPOSED PLAN TO REMEDY SOIL CONTAMINATION AT THE FAIRWAY SIX DISPOSAL SITE (OPERABLE UNIT TWO). FACT SHEETS WERE PROVIDED AS WELL AS HANDOUTS OF THE SLIDE PRESENTATION AND SELF-ADDRESSED COMMENT CARDS.

II. SUMMARY OF MAJOR QUESTIONS AND COMMENTS RECEIVED DURING THE PUBLIC MEETING AND COMMENT PERIOD AND EPA RESPONSES.

THE PUBLIC MEETING HELD ON MAY 16, 1989, BEGAN AT 7:00 P.M. AND WAS ADJOURNED AT 8:30 P.M. THE FORTY ATTENDEES CONSISTED OF FEDERAL, STATE AND LOCAL OFFICIALS, LOCAL CITIZENS AND LOCAL AND REGIONAL REPORTERS.

THE COMMUNITY EXPRESSED CONCERNS ABOUT OBNOXIOUS GASES EMMITTED DURING THERMAL TREATMENT, THE NATURE OF RESIDUAL ASH FROM THE INCINERATOR FACILITY AND THE STATE OF NORTH CAROLINA'S COST SHARE FOR THIS REMEDIAL ACTION.

ALSO, EPA RECEIVED TWO LETTERS, ONE FROM THE LEAGUE OF WOMEN VOTERS OF MOORE COUNTY AND ONE FROM THE CLEAN WATER FUND OF NORTH CAROLINA. RESPONSES WERE PROVIDED TO EACH ORGANIZATION AND ARE PART OF THIS RESPONSIVENESS SUMMARY (SEE CORRESPONDENCE ATTACHED). BELOW IS A SUMMARY OF EPA RESPONSES TO CONCERNS RAISED AT THE PUBLIC HEARING AND TO WRITTEN COMMENTS RECEIVED BY EPA.

THE TWO MOST SIGNIFICANT COMMENTS RECEIVED AT THE PUBLIC MEETING CONCERNED AIR EMISSIONS FROM THE THERMAL TREATMENT PROCESS AND THE NATURE OF THE INCINERATOR RESIDUE. EPA RESPONDED TO THE CONCERN OF OBNOXIOUS FUMES EMMITTING FROM THE INCINERATOR BY EXPLAINING THAT THE INCINERATOR WOULD BE REQUIRED TO DEMONSTRATE ITS CAPABILITY OF COMPLYING WITH STRICT RCRA AIR EMISSION STANDARDS. MS. MELANIE MCDONALD, A LOCAL CITIZEN, WAS CONCERNED THAT THE ONSITE DISPOSAL OF INCINERATOR ASH WOULD NOT BE SAFE TO ALLOW CHILDREN TO PLAY IN. EPA RESPONDED BY EXPLAINING THAT THE RESIDUAL ASH WILL BE TESTED TO VERIFY THAT THE ASH IS NO LONGER HAZARDOUS AND THAT IF THE TEST RESULTS INDICATE THAT THE THERMAL TREATMENT HAS NOT MEET THE CLEANUP CRITERIA, THEN THE ASH WILL HAVE TO BE PLACED ELSEWHERE, SOLID WASTE DISPOSAL FACILITY OR RCRA FACILITY. CLEANUP CRITERIA INCLUDES THE EP TOXICITY TEST AND CLEANUP TO BACKGROUND LEVELS, WHICH ARE 2.3 MG/KG TOTAL PESTICIDES.

MR. CALVIN LITTLE, ONE OF THE SITE PROPERTY OWNERS, WAS CONCERNED THAT A RCRA LANDFILL CONSTRUCTED ON SITE, WOULD CAUSE CONSIDERABLE LOSS IN ECONOMIC VALUE OF HIS PROPERTY. EPA DISCUSSED THIS CONCERN HYPOTHETICALLY SINCE THE PROPOSED PLAN DID NOT INVOLVE THE CONSTRUCTION OF AN ON SITE RCRA LANDFILL. THE EXISTING STOCKPILE IS LOCATED ON MR. LITTLE'S PROPERTY.

A LOCAL REPORTER FOR THE CITIZEN'S NEWS RECORD, CLAUDIA MADELEY, WAS INTERESTED IN THE STATE'S POSITION ON PROVIDING ITS 10 PERCENT COST-SHARE FOR THE 14-MILLION DOLLAR PROPOSED REMEDY. MS. LEE CROSBY, HEAD OF THE NC SUPERFUND BRANCH RESPONDED BY STATING THAT THE STATE WAS AWARE OF THE 10% COST-SHARE AND THAT THE NC LEGISLATURE WAS DRAFTING A CERTIFIED BUDGET WHICH WOULD ADDRESS THIS PARTICULAR ISSUE. SHOULD THE STATE NOT BE ABLE TO FUND ITS COST-SHARE FOR THIS REMEDIAL ACTION, THE REMEDIAL ACTION WOULD NOT BE CARRIED OUT BY EPA UNTIL FUNDING WOULD BECOME AVAILABLE FROM THE STATE.

IN ADDITION, OTHER GENERAL COMMENTS WERE RECEIVED CONCERNING GROUNDWATER MONITORING ACTIVITY ONGOING AT THE SITE, THE RECENTLY FILED LAWSUIT AGAINST FIVE DEFENDANTS BY THE DEPARTMENT OF JUSTICE ON BEHALF OF EPA. REGION IV, AND THE ROUTE 211 SITE. EPA. EXPLAINED THAT THE REMEDIAL INVESTIGATION FOR OPERABLE UNIT ONE WAS ONGOING AND THIS INVESTIGATION INCLUDED INSTALLATION OF MONITORING AT VARIOUS SITES THROUGHOUT ABERDEEN INCLUDING THE FAIRWAY SIX SITE. EPA ALSO EXPLAINED THAT A LAWSUIT HAD BEEN FILED IN FEDERAL DISTRICT COURT IN GREENSBORO, NORTH CAROLINA AND THAT FIVE DEFENDANTS HAD BEEN NAMED IN THE LAWSUIT. SUSAN MCCONNELL, A CONCERNED CITIZEN

WAS UNAWARE OF THE ROUTE 211 SITE AND ASKED EPA TO DISCUSS THIS DUMP SITE. MR. NED JESSUP, EPA OSC PROVIDED DETAILED INFORMATION ON THE LOCATION, HISTORY AND STATUS OF THIS DUMP SITE.

A COMMENT FROM THE FLOOR WAS MADE FROM THAT THE PUBLIC WAS NOT ADEQUATELY INFORMED ABOUT THE MEETING. CLAUDIA MADELEY OF THE CITIZEN'S NEWS RECORD RESPONDED BY SAYING THAT AN ADVERTISEMENT ANNOUNCING THE MEETING TIME AND PLACE HAD BEEN IN THE CITIZEN'S NEWS RECORD THREE TIMES PRIOR TO THE MEETING.

WRITTEN COMMENTS WERE PROVIDED TO EPA BY THE LEAGUE OF WOMEN VOTERS OF MOORE COUNTY AND THE CLEAN WATER FUND OF NORTH CAROLINA. EACH GROUP HAD SIMILAR CONCERNS RELATING TO AIR EMISSIONS FROM THE THERMAL TREATMENT FACILITY, METAL CONCENTRATIONS IN THE STOCKPILE AND THE STATE OF NORTH CAROLINA'S REQUIREMENT THAT A PERMIT BE ISSUED TO OPERATE THE THERMAL TREATMENT FACILITY. EPA RESPONDED BY EXPLAINING THAT THE FACILITY MUST OPERATE UNDER STRICT RCRA PERFORMANCE STANDARDS. EPA IS AWARE THAT NC IS CURRENTLY PROPOSING AIR EMISSION STANDARDS AND WILL CONSIDER THOSE STANDARDS DURING THE REMEDIAL DESIGN PHASE. CONCERNING METALS, IT IS APPARENT FROM SAMPLE ANALYSIS OF THE STOCKPILE THAT LOW LEVELS OF ARSENIC, BARIUM, CHROMIUM, COPPER, LEAD, AND ZINC ARE PRESENT IN THE WASTE. HOWEVER, IT APPEARS THAT THESE LEVELS ARE REPRESENTATIVE OF BACKGROUND IN THE ABERDEEN AREA AND POSE NO SIGNIFICANT RISK TO PUBLIC HEALTH OR THE ENVIRONMENT. EPA ALSO EXPLAINED THAT CERCLA, AS AMENDED BY SARA, DOES NOT REQUIRE THAT A PERMIT BE OBTAINED FROM A FEDERAL, STATE OR LOCAL OFFICE FOR THE PORTION OF A REMEDIAL ACTION CONDUCTED ON-SITE.

III. CORRESPONDENCE.

ATTACHED ARE THE WRITTEN COMMENTS RECEIVED BY EPA DURING THE 21 DAY COMMENT PERIOD AND RESPONSES PROVIDED BY EPA TO THE COMMENT WRITERS. ALSO ATTACHED IS CORRESPONDENCE FROM CONGRESSMEN BILL HEFNER.

LEAGUE OF WOMEN VOTERS OF MOORE COUNTY

POST OFFICE BOX 673, ABERDEEN, NORTH CAROLINA 28315

JUNE 2, 1989

MS KAY CRANE, REMEDIAL PROJECT MANAGER
US EPA - REGION IV
345 COURTLAND STREET NE
ATLANTA, GA 30365

RE: DISPOSAL SITE (OPERABLE UNIT 2) ABERDEEN, NORTH CAROLINA

DEAR MS CRANE;

THE LEAGUE OF WOMEN VOTERS OF MOORE COUNTY IS PLEASED TO PROVIDE COMMENTARY IN RESPONSE TO THE INVITATION EXTENDED BY THE EPA AT THEIR MAY 16TH PUBLIC MEETING. WE REGRET THAT WE CANNOT SUPPORT THE EPA'S PREFERRED ALTERNATIVE NO. 8 FOR THE DISPOSAL OF TOXIC WASTES AT FAIRWAY SIX DISPOSAL SITE (OPERABLE UNIT 2), ABERDEEN, NORTH CAROLINA.

THE REASONS THAT WE CANNOT SUPPORT THE SUGGESTED ALTERNATIVE NO. 8 ARE;

1. THE FEASIBILITY STUDY FAILS TO ACCOUNT FOR POTENTIAL AIR POLLUTANTS ASSOCIATED WITH THE INCINERATION OF THE WASTES. WE HAVE LEARNED THAT HEAVY METALS ARE ALSO PRESENT IN THE WASTE. NO EVIDENCE IS PRESENTED REGARDING THE FATE OF THESE HEAVY METALS DURING INCINERATION. FURTHER, NO MENTION IS MADE OF THE NORTH CAROLINA PERMIT PROCESS WHICH WOULD APPLY TO ORDINARY PERSONS INCINERATING HAZARDOUS WASTES, EVEN THOUGH THE FEASIBILITY STUDY STATED THAT THE PROCESS WAS INTENDED TO COMPLY WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS).
2. AS WE UNDERSTAND RCRA (RESOURCE CONSERVATION AND RECOVERY ACT), THE USE OF A NON-RCRA LANDFILL IS NOT ACCEPTABLE FOR THE DISPOSAL OF HAZARDOUS WASTES, EVEN THOUGH THEY HAVE BEEN TREATED. HAS EPA FOLLOWED THE PROCEDURES NECESSARY TO RECEIVE A WAIVER OF THESE REQUIREMENTS? IF A RCRA LANDFILL MUST BE USED FOR THE DISPOSAL OF THE INCINERATED RESIDUE, THEN IT WOULD APPEAR THAT INCINERATION IS AN EXTREMELY EXPENSIVE (PROBABLY UNWARRANTED) WAY OF REDUCING THE VOLUME OF WASTE. NO COST BENEFIT DATA ARE PRESENTED TO ANSWER THIS QUESTION.

THE LEAGUE OF WOMEN VOTERS OF MOORE COUNTY HAS DILIGENTLY STUDIED THIS ISSUE FOR SOME FOUR YEARS AND WE BELIEVE WE HAVE SUFFICIENT INFORMATION TO WARRANT A FIRM OPINION IN THIS MATTER. IT IS OUR VIEW THAT THE ONLY ECONOMICALLY FEASIBLE AND ENVIRONMENTALLY SOUND METHOD OF DISPOSAL IS THAT DESCRIBED AS ALTERNATIVE NO. 4 (OFFSITE LAND DISPOSAL IN A RCRA PERMITTED LANDFILL). THE NO. 4 ALTERNATIVE MAKES MOOT THE ISSUES OF AIR POLLUTION, STATE PERMITS AND THE ARARS. IT ALSO IS THE MOST ECONOMICAL AND ACCEPTABLE DISPOSAL METHOD AMONG THOSE OFFERED BY EPA, AT A COST ESTIMATED BY EPA AT \$10,043,000 AS AGAINST \$14,634,000 FOR ALTERNATIVE NO. 8.

SINCERELY,

CHARLOTTE GANTZ, CHAIRMAN
HAZARDOUS WASTE UNIT

PHYLLIS KALK, PRESIDENT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

4WD-SFB

MS. PHYLLIS KALK, PRESIDENT
LEAGUE OF WOMEN VOTERS OF MOORE COUNTY
P.O. BOX 673
ABERDEEN, NORTH CAROLINA 28315

RE: FAIRWAY SIX DISPOSAL SITE
ABERDEEN, MOORE COUNTY, NORTH CAROLINA

DEAR MS. KALK;

THIS LETTER IS IN RESPONSE TO YOUR LETTER DATED JUNE 2, 1989 IN WHICH, THE LEAGUE OF WOMEN VOTERS OF MOORE COUNTY PROVIDED COMMENTS TO EPA'S PROPOSED PLAN FOR REMEDY ACTION SELECTION AT THE SUBJECT SITE. A RESPONSE IS PROVIDED FOR EACH COMMENT.

1) COMMENT: THE FS FAILS TO ACCOUNT FOR POTENTIAL AIR POLLUTANTS ASSOCIATED WITH THE INCINERATION OF THE WASTES.

RESPONSE: THE THERMAL TREATMENT FACILITY WOULD OPERATE UNDER PERFORMANCE STANDARDS OF THE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA). EPA HAS DEVELOPED STANDARDS THAT PLACE STRICT LIMITS ON THE QUANTITIES OF POLLUTANTS IN EMISSIONS FROM THERMAL TREATMENT FACILITIES. A TRIAL TEST BURN WILL BE PERFORMED PRIOR TO COMMENCING THE FULL SCALE REMEDIAL ACTION TO DEMONSTRATE THAT THE THERMAL TREATMENT FACILITY IS CAPABLE OF MEETING RCRA PERFORMANCE STANDARDS.

2) COMMENT: WE HAVE LEARNED THAT HEAVY METALS ARE ALSO PRESENT IN THE WASTE. NO EVIDENCE IS PRESENTED REGARDING THE FATE OF THESE HEAVY METALS DURING INCINERATION.

RESPONSE: SAMPLE ANALYSIS OF THE STOCKPILE INDICATES THAT METALS ARE PRESENT IN THE WASTE STREAM. HOWEVER, THESE LEVELS APPEAR TO BE REPRESENTATIVE OF BACKGROUND IN THE ABERDEEN AREA. BASED ON THE INFORMATION AVAILABLE TO EPA, METAL CONCENTRATIONS IN THE STOCKPILE POSE NO SIGNIFICANT HEALTH CONCERN TO THE PUBLIC OR THE ENVIRONMENT. MONITORING WILL BE PERFORMED THROUGHOUT THE REMEDIAL ACTION TO ASSURE THE METAL CONCENTRATIONS DO NOT BECOME A PROBLEM.

3) COMMENT: NO MENTION IS MADE OF THE NORTH CAROLINA PERMIT PROCESS WHICH WOULD APPLY TO ORDINARY PERSONS INCINERATING HAZARDOUS WASTE, EVEN THOUGH THE FEASIBILITY STUDY STATED THAT THE PROCESS WAS INTENDED TO COMPLY WITH ARAR'S

RESPONSE: ALTHOUGH EPA WILL COMPLY WITH ARAR'S, SUBSECTION 121(E) OF CERCLA, AS AMENDED BY SARA, STATES THAT "NO FEDERAL, STATE OR LOCAL PERMIT IS REQUIRED FOR THE PORTION OF ANY REMOVAL OR REMEDIAL ACTION CONDUCTED ENTIRELY ONSITE, WHERE SUCH REMEDIAL ACTION IS SELECTED AND CARRIED OUT IN COMPLIANCE WITH THIS SECTION."

4) COMMENT: AS WE UNDERSTAND RCRA, THE USE OF A NON-RCRA LANDFILL IS NOT ACCEPTABLE FOR THE DISPOSAL OF HAZARDOUS WASTE, EVEN THOUGH THEY HAVE BEEN TREATED. HAS EPA FOLLOWED THE PROCEDURES NECESSARY TO RECEIVE A WAIVER OF THESE REQUIREMENTS?

RESPONSE: THE WASTE MATERIALS IN THE STOCKPILE ARE CLASSIFIED AS A RCRA HAZARDOUS WASTE BY CHARACTERISTIC. THE CHARACTERISTIC OF EP TOXICITY FOR THE PESTICIDE LINDANE IS EVIDENT IN THE WASTE STREAM. YOUR UNDERSTANDING IS CORRECT ONLY IF THE WASTE IS A RCRA LISTED WASTE IN WHICH CASE THE WASTE WOULD HAVE TO BE DELISTED IN ORDER TO DISPOSE OF THE RESIDUAL ASH IN A NON-RCRA LANDFILL. EPA HAS DETERMINED THAT THE CONTAMINATED SOIL AND DEBRIS IS A RCRA WASTE BY CHARACTERISTIC AND WILL TREAT THE WASTE SUCH THAT THE WASTE NO LONGER EXHIBITS THE EP TOXICITY CHARACTERISTIC. EPA HAS DETERMINED THAT THE THERMAL TREATMENT TECHNOLOGY CAN ADEQUATELY DETOXYFIFY THE WASTE AND ELIMINATE OR REDUCE THE WASTE CONSTITUENTS TO A LEVEL EQUAL TO OR LESS THAN BACKGROUND.

5) COMMENT: IF A RCRA LANDFILL MUST BE USED FOR THE DISPOSAL OF THE INCINERATED RESIDUE, THEN IT WOULD APPEAR THAT INCINERATION IS AN EXTREMELY EXPENSIVE (PROBABLY UNWARRANTED) WAY OF PRODUCING THE VOLUME OF WASTE. NO COST BENEFIT DATA ARE PRESENTED TO ANSWER THIS QUESTION. THE NO.4 ALTERNATIVE MAKES MOOT THE ISSUES OF AIR POLLUTION, STATE PERMITS AND THE ARARS. IT ALSO IS THE MOST ECONOMICAL AND ACCEPTABLE DISPOSAL METHOD AMONG THOSE OFFERED BY EPA, AT A COST ESTIMATED BY EPA AT \$10,043,000 AS AGAINST \$14,634,000 FOR ALTERNATIVE NO. 8.

RESPONSE: YOUR RECOMMENDATION OF ALTERNATIVE 4, OFFSITE LAND DISPOSAL, ALTHOUGH THE MOST ECONOMICAL, DOES NOT MEET CERCLA/SARA'S PREFERENCE TO USE PERMANENT CLEANUP METHODS, CALLING FOR DETOXIFYING WASTES WHENEVER POSSIBLE, RATHER THAN BURYING THEM IN LANDFILLS.

SUBSECTION 121(E) OF CERCLA, AS AMENDED BY SARA, STATES

"REMEDIAL ACTIONS IN WHICH TREATMENT PERMANENTLY AND SIGNIFICANTLY REDUCES THE VOLUME, TOXICITY OR MOBILITY OF THE HAZARDOUS SUBSTANCES, POLLUTANTS AND CONTAMINANTS AS A PRINCIPAL ELEMENT, ARE TO BE PREFERRED OVER REMEDIAL ACTIONS NOT INVOLVING SUCH TREATMENT. THE OFFSITE TRANSPORT AND DISPOSAL OF HAZARDOUS SUBSTANCES OR CONTAMINATED MATERIALS WITHOUT SUCH TREATMENT SHOULD BE THE LEAST FAVORED ALTERNATIVE REMEDIAL ACTION WHERE PRACTICABLE TREATMENT IS AVAILABLE."

MOREOVER, WITH STRINGENT LAND DISPOSAL RESTRICTIONS, IT IS BECOMING MORE DIFFICULT TO LOCATE A HAZARDOUS WASTE FACILITY WHICH WOULD ACCEPT THIS WASTE WITHOUT PRIOR TREATMENT.

I HOPE THIS RESPONSE ADEQUATELY ADDRESSES CONCERNS OF THE LEAGUE OF WOMEN VOTERS. DO NOT HESITATE TO CONTACT ME IF YOU HAVE ANY FURTHER QUESTIONS.

SINCERELY,

REMEDIAL PROJECT MANAGER
WASTE MANAGEMENT DIVISION

#TAB

TABLE 2

MAJOR LABORATORY RESULTS FROM JUNE 1989 SAMPLING
OF THE FAIRWAY SIX STOCKPILE

SAMPLE NO. ALPHA-BHC GAMMA-BHC 4-4'-DDD 4,4'-DDT HEPTACHLOR TOXAPHENE
(A) (MG/KG)

COMPOSITE

"9" (1)	BQL (4)	BQL	BQL	560	BQL	BQL
F6EE (2)	230	43	220	BQL	BQL	BQL
F6T3 (3)	BQL	BQL	BQL	BQL	26	BQL

(B) (MG/L)

EP TOXICITY
RESULTS

COMPOSITE

"9"	.39	BQL
F6EE	.88	BQL

(1) COMPOSITE SOIL SAMPLE OF A TOTAL ON FINE SAMPLES COLLECTED FROM THE FAIRWAY SIX STOCKPILE.

(2) FAIRWAY SIX SOIL SAMPLE COLLECTED FROM THE EAST END OF THE STOCKPILE.

(3) FAIRWAY SIX SOIL SAMPLE COLLECTED FROM THE TOP OF THE STOCKPILE AT A VERTICAL DEPTH OF 3 FEET.

(4) BQL - BELOW QUANTITATION LIMIT

NOTE: A TOTAL PESTICIDE/PCB SCAN WAS ANALYZED FOR IN 9 SOIL SAMPLES COLLECTED FROM THE FAIRWAY SIX STOCKPILE AND ONE COMPOSITE OF THOSE NINE SAMPLES. HIGHEST CONCENTRATIONS OF PESTICIDES DETECTED ARE REPORTED.

TABLE 5

REMEDIAL TECHNOLOGY ALTERNATIVES THAT PASSED INITIAL SCREENING

1. NO ACTION
 - WITHOUT PERIODIC ENVIRONMENTAL MONITORING
 - WITH PERIODIC ENVIRONMENTAL MONITORING
2. CONTAINMENT
3. REMOVAL
4. ON-SITE TREATMENT
 - INCINERATION
 - STABILIZATION/SOLIDIFICATION (PHYSICAL/CHEMICAL TREATMENT)
 - BIOLOGICAL TREATMENT
5. OFF-SITE TREATMENT
 - INCINERATION
 - STABILIZATION/SOLIDIFICATION (PHYSICAL/CHEMICAL TREATMENT)
 - BIOLOGICAL TREATMENT
6. IN SITU TREATMENT
 - BIORECLAMATION
 - SOIL WASHING/FLUSHING
 - VITRIFICATION
 - STABILIZATION/SOLIDIFICATION
7. ON-SITE LAND DISPOSAL
8. OFF-SITE LAND DISPOSAL

TABLE 7
ESTIMATED COST SUMMARY FOR THE SELECTED REMEDY

CAPITAL COSTS	COST
ACCESS IMPROVEMENT AND SECURITY	\$61,200
WASTE/SOIL EXCAVATION	\$630,000
SITE PREPARATION	\$111,000
BELOW-GRADE LANDFILL FOR INCINERATOR ASH	\$39,300
ONSITE THERMAL TREATMENT/AIR POLLUTION CONTROL	\$9,200,000
START-UP COST	\$77,000
ESTIMATED CAPITAL COST	\$10,118,500
LEVEL OF HEALTH/SAFETY PROTECTION	\$1,012,000
HEALTH & SAFETY MONITORING	\$223,000
SUBTOTAL	\$11,353,500
20% CONTINGENCY	\$2,271,000
INSTITUTIONAL AND ENGINEERING	\$908,000
TOTAL ESTIMATED CAPITAL COST	\$14,533,000